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## ON THE BIRDS OF THE KUNGWE-MAHARI AREA IN WESTERN TANGANYIKA TERRITORY

By

STAFFAN ULFSTRAND AND HUGH LAMPREY

### INTRODUCTION

This is a report on the more interesting avifaunistical and taxonomic findings of the Oxford University Tanganyika Expedition in which the authors took part as zoologists. The investigation area consisted of the Kungwe-Mahari area on the east shore of Lake Tanganyika, in Western Province, Tanganyika Territory (lat. 6° S., long. 30° E.). This area is of especial interest from a zoogeographical point of view, since it lies in the transition zone between the chief West African and East African subdivisions of the Ethiopian Region. The fact that it is an isolated mountain block inhabited by several endemic subspecies of birds and one endemic species adds further interest to the area. It has, so far as we are aware, never been visited by a zoologist intent on making a thorough survey of any animal group, but Moreau (1943) sent his African collector into the area during a fairly long period. Moreau's paper is the only previous ornithological contribution from the area.

The 1958 Expedition party consisted of three botanists, one geologist and two anthropologists, apart from the zoologists. S.U. worked in the area from July 4 until September 10, while H.F.L. departed on August 8.

The zoological work (and indeed the carrying out of the whole project) was made possible by the generous support and kindness of the Ministry of National Resources and the Game Warden, Mr. G. H. Swynnerton, to whom we are particularly grateful for putting a team of game scouts at our disposal. The Game Ranger of Western Province, Mr. A. J. Mence, favoured our work in several ways, participating in it for two periods. The Head Game Scout, Mr. Musa Rajabu, contributed substantially to the success of our work by his constant interest and his ability as a supervisor of the African staff.

The participation in the expedition of S.U. was made possible through generous grants from the Swedish State Council for Scientific Research and Helge Axelson Johnson's Foundation. A journey to London in March, 1959, was facilitated through a grant from the Royal Physiographical Society of Lund, and at the British Museum much advice was given by Mr. J. D. Macdonald and Mrs. B. P. Hall to whom thanks are also due.

### Brief description of the investigation area

Only a very brief survey of the chief habitat types within the area is given here, since a more detailed description of the ecology of the bird fauna is planned to be worked out later.

It should first be mentioned that our stay in Kungwe-Mahari fell entirely within the dry season. No rain at all occurred during the months spent there.

1. As is well known, Lake Tanganyika is extremely deep. There are practically no islands, and the shores are generally steep and rocky. In some places, however, the



shore consists of sandy beaches. The aquatic macro-vegetation seems to be negligible if not absent. All these circumstances make the lake very poor from an ornithologist's point of view. However, the fish fauna is abundant, and it is somewhat surprising that there are so few birds utilising this source of food.

2. Behind the beaches there is usually a zone of mixed *Acacia-Brachystegia* woodland with patches of dense bushes and tall grass. This is a rich zone, several species of birds being found exclusively in it. These species, therefore, seem to be ecologically dependent upon the acacias, which constitute the chief distinction of this habitat.

3. Between the lake and the mountain ridges there is an area of lowland where the ground is flat or slightly undulating. It is covered by a nearly unbroken *Brachystegia* woodland. The trees are of relatively small size, and undergrowth is in the dry season nearly absent. The bird life is extremely poor, having few if any distinctive species.

4. Above about 4,500 ft. the Kungwe-Mahari mountains are covered with grassland, only occasional clumps of trees being found on the ridges. The higher the level, the shorter the grass and the richer is the flora of herbs. Parts of the grassland were burnt during our stay in the area.

5. Along rivers and creeks on the slopes of the Kungwe-Mahari ridge there are gallery forests of varying richness. Some are fairly poor, others are incredibly dense and luxuriant. An important division may be made between forests without and those with bamboo (*Arundinaria*), the transition coming at about 6,000 ft. At the highest peaks, the forests broaden out and lose their dependence upon the streams. Ecologically there do not seem to exist important differences between high gallery forests and mountain forests.

6. To the east of Kungwe-Mahari and separated from it by a valley, there is another ridge running parallel to the main ridge but considerably lower. It is known as Kabesi ridge. This is covered with a *Brachystegia* woodland which differs from the lowland type in carrying leaves towards the end of the dry season. The avifauna was incomparably richer here than in the lowland *Brachystegia*. On the slopes of the ridges there was a narrow zone of lowland bamboo (*Oxytenanthera*), which was dry and practically devoid of higher animal life.

### Scope of the ornithological work in Kungwe-Mahari

The aim of the ornithological work was to make as complete a survey of the avifauna in all habitats as the time would allow. We therefore carried out collecting and observation work in all the habitats described above. The bird collection amounts to over 300 specimens. It has been shared between the Zoological Museum of Lund University, Sweden, and the Game Department Museum, Arusha, Tanganyika Territory. We did not see any point in collecting specimens of easily recognisable species, such as larger birds of prey, herons and storks. For many purposes, a reliable sight-record is as useful as a skin of these species.

We also paid attention to some problems besides the purely faunistical ones. All evidence on breeding status was carefully collected, and our notes in this matter seem to contain many records of considerable interest. In August, S.U. paid particular

attention to the ecological distribution of the species of the families Pycnonotidae and Muscipidae, and the material gathered will be published in a separate context. S.U. also made a study of the migratory behaviour in two species of birds of prey (*Milvus migrans*, *Aquila wahlbergi*).

In this paper we give a report on those species which seem to be of faunistical and/or taxonomical interest. Some specific problems which have been discussed elsewhere are referred to in this communication also.

Sight-records are given without subspecific names, as subspecies generally should not be determined in the field.

### Selected list of birds found in Kungwe-Mahari

*Melanophoyx ardesiaca* (Wagler). Recorded independently by H.F.L. and S.U. at the lake shore on July 8. Probably a casual wanderer.

*Erythrocnus rufiventris* (Sundevall). A female with inactive gonads collected at the lake shore on July 16. The only record of this scarce species.

*Ardeirallus sturmii* (Wagler). A female with inactive gonads collected at the lake shore on July 18. The only record of the species.

*Torgos tracheliotus* (Forster). Three observations of two, one and one birds respectively. The distribution given for this species in Mackworth-Praed and Grant (I:134) is incorrect whilst the data in Chapin (I:533) are truer. The species occurs in many places in North, Central and Western Tanganyika.

*Falco peregrinus* Tunstall. A pair was seen at close quarters and under circumstances very strongly indicating breeding on the peak of Mt. Sisaga (8,100 ft.). This is an interesting record in view of the divergent opinions in handbooks about the status of this species in tropical Africa.

*Milvus migrans* (Boddaert) (= *Milvus aegyptius* Sharpe and Bouvier). As published in some detail elsewhere (Ulfstrand, in press) there was a tremendous southward passage migration of this species in August and early September, nearly 1,000 birds being counted on migration in one single day (August 9). They were not palaeartic birds, being yellow-billed, and probably they were on their way southwards to breed. The time of the year fits well with data from Northern Rhodesia (Benson and White 1957) and South Africa (Roberts 1958).

*Machaehamphus alcinus* Westernman. One individual seen late in the evening of September 5 at a small village near the foot-hills of Mahari ridge (3,800 ft.). The behaviour of the bird was conclusive as its appearance, for it caught a bat in mid-air and started eating it in full flight.

*Aquila wahlbergi* Sundevall. The migratory movements of this species have been described together with those of the Kite. It may only be mentioned that the general direction of movement of this species was also south. Some pairs were seen courtship-displaying in a typically aquiline-buteonine way, the male "playfully" diving towards the female.

*Stephanoaetus coronatus* (Linné). One or two pairs were present on Mahari ridge and were doubtless breeding.

*Cuncuma vocifer* (Daudin). Very common along the lake shore. Our observations do not support the assumption of Moreau (1943:400) that this species and:—

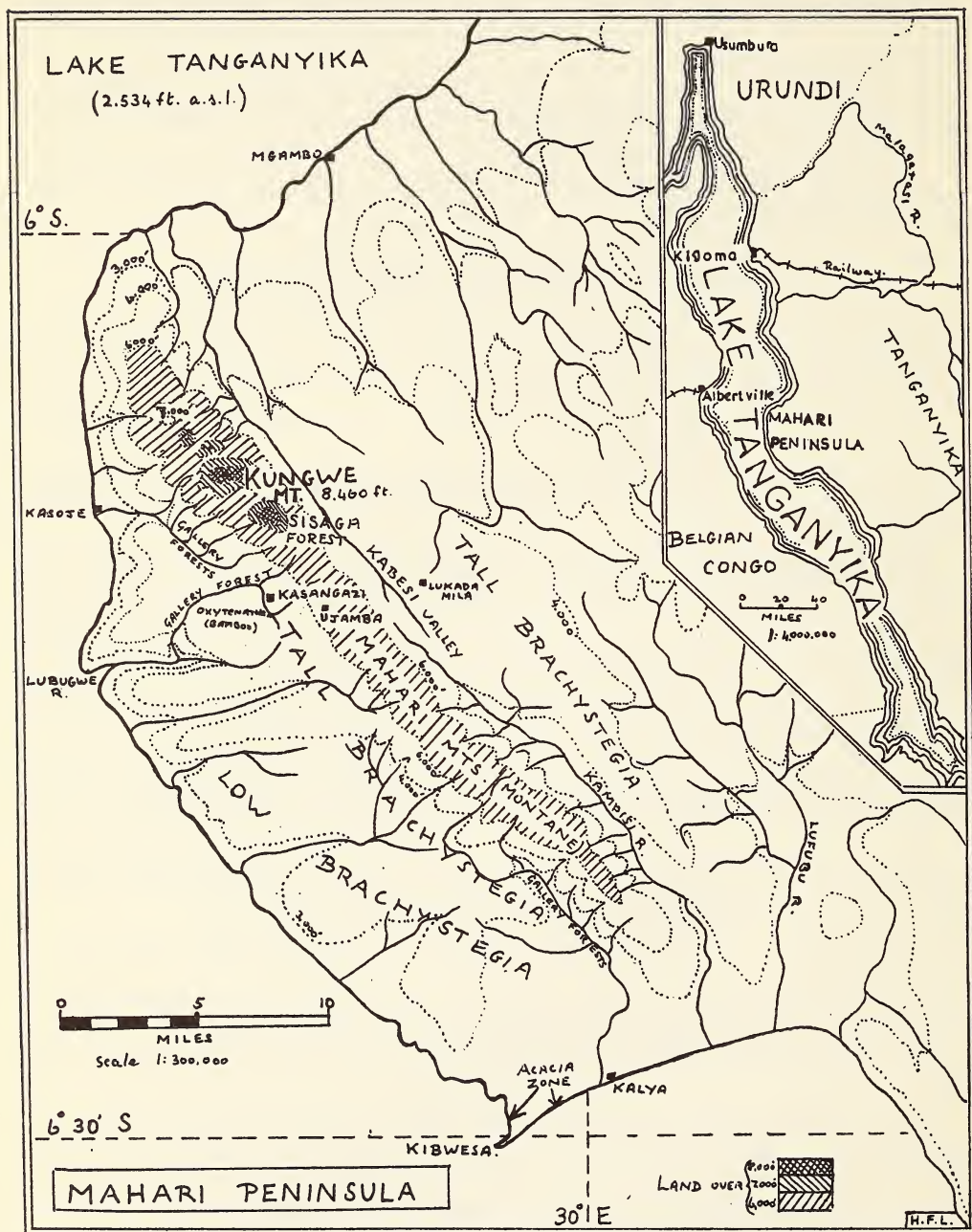
*Gypohierax angolensis* (Gmelin) are mutually exclusive, for both were seen in numbers over the bay at Kigoma. At Kungwe-Mahari the latter species was, however, only recorded a few times.

*Buteo oreophilus* Hartert and Neumann. Some relatively small buzzards having light undersides with dark spots and stripes which were recorded over Mahari and Kabesi ridges have tentatively been assigned to this name. They were not juveniles of *Buteo rufofuscus* (Forster). Recently Rudebeck (1956) has made a very good case for including *B. oreophilus* into *B. buteo*, and it is undeniable that the birds seen by us were strongly reminiscent of Common Buzzards in outline and flight. This field impression is mentioned for any value it may have.

*Pandion haliaetus* (Linné). One or two individuals constantly observed at Lake Tanganyika in July and August.

*Tringa hypoleucos* Linné. Several birds "summering" at Lake Tanganyika (one, unsexed,





collected July 9). Already from the beginning of August their numbers started rising, and the species was common from about August 20.

*Tringa glareola* Linné. One recorded on September 8 at Lake Tanganyika.

*Tringa nebularia* (Gunnerus). Single birds at Lake Tanganyika on August 7 and September 8.

*Numenius arquata* (Linné). Two flying south over the lake shore on September 10.

*Numenius phaeopus* (Linné). One at Lake Tanganyika on September 8.

*Chlidonias leucoptera* (Temminck). A small flock was stationary at a rocky point in Lake Tanganyika in July, but numbers gradually fell and none were seen after August 1. Three specimens were collected on July 13, one male in breeding plumage with slightly active gonads and two males in non-breeding plumage with dormant gonads.

*Streptopelia lugens* (Rüppell). A scarce species, nesting in dense gallery forests at 6,500 to 7,500 ft. One nest was found in a branch fork about 24 ft. above the ground. A female collected on July 28 had an egg ready to be laid in the oviduct.

*Aplopelia larvata larvata* (Temminck and Knip). One specimen was collected on July 27 near the village of Ujumba at 7,000 ft. It is the only record of the species. The determination of the bird was made after careful comparisons in the British Museum, and there is no doubt that it agrees perfectly with the topotypical material of *larvata*. It is of great interest to note that the West African dove *A. simplex jacksoni* Sharpe has been found in Kungwe-Mahari by Moreau (1943:387) both for the taxonomy of the forms involved and from zoogeographical reasons.

*Pachycoccyx audeberti validus* (Reichenow). A female with slightly active gonads was collected on Kabesi ridge on August 22.

*Tauraco corythaix schalowi* (Reichenow). We follow Moreau (1958) in the classification of the turaco. This species of which three specimens were taken on August 1, 10 and 26, was common in gallery forests above 6,000 ft. but was on a few occasions found also in lowland *Brachystegia*. In the gallery forests it was in full breeding, but the birds in the lowland were always in family parties. The higher the level, the more abundant was the species. Our specimens agree well with the ssp. *schalowi*. The only other turaco in the area was *Tauraco porphyreolophus chlorochlamys* (Shelley) of which also three specimens were secured. It was a lowland bird, isolated from contact with the preceding species but for the family parties of corythaix descending into the lowland after breeding (cf. Moreau *op. cit.*: 111).

*Merops apiaster* Linné. During our last three days in the area, viz. September 8 to 10, large flocks of this bird were recorded.

*Merops superciliosus superciliosus* Linné. On the same days as for the preceding species, large numbers of this bird were also seen, and one specimen, a female with inactive gonads, was secured on September 10.

*Merops nubicoides* Des Murs and Pucheran. On August 20, a flock of 14 birds was attending a grass-fire on Kabesi ridge. After a while they gained height and disappeared southwards.

*Glaucidium perlatum* (Vieillot). A male collected near the lake shore on August 12. There was a family with fledged young resident at the place, near Kibwesa Point.

*Glaucidium capense capense* (Smith). A female collected near the lake shore on August 10 is the only record of the species.

*Bubo lacteus* (Temminck). One bird observed at close quarters in *Brachystegia* woodland near the lake shore on July 16 by B. E. Juniper, botanist to the Expedition, and S.U.

*Caprimulgus fervidus fervidus* Sharpe (= *C. pectoralis fervidus* Sharpe). A male with much enlarged testes was collected at the foot of Mahari ridge on July 22.

*Semeiophorus vexillarius* Gould. A male with elongated primaries and active gonads was collected in highland *Brachystegia* on September 1. Several small groups were recorded in the last days of August and first week in September, but none had been seen before. There thus seemed to be a sudden influx about this time into the area.

*Colius striatus cinerascens* Neumann. Two birds were collected, viz. a male near the lake shore on July 11 and a female at the foot of Mahari ridge on July 25. Both had active gonads. It seems that the classification of this species is in a fairly confused state and in need of a thorough revision. We have compared our specimens with several East African subspecies, and find that they agree very well with ssp. *cinerascens*. Topotypical material of this subspecies was available i.e. in the Game Dept. Museum, Arusha. According to Mackworth-Praed and Grant



(I:685 *et seq.*) the subspecies coming nearest to Kungwe-Mahari is *ugandensis* van Someren, but our birds are definitely greyer. The more southerly subspecies *affinis* Shelley is also more rufous, particularly in the crest, than our specimens. The colour of the iris in our birds was lemon-yellow. The population was, at least in part, breeding.

*Lybius torquatus zombae* (Shelley). Two specimens were secured, both females and one with active, the other with inactive gonads. Our specimens have been carefully compared with material of the nominate race (type locality: Cape Province) and of the subspecies *zombae* (type locality: Zomba, Southern Nyasaland), and we find that they agree much better with the latter group. With this conclusion, Mrs. B. P. Hall is in agreement. It has to be admitted that the red colour of the breast and belly is very variable indeed, but the colour and stippling of the upper parts allow subspecific determination. Nests were found in July.

*Indicator minor minor* Stephens. A male was collected in dense mountain forest near Mt. Sisaga on September 1. It was flushed from the remnants of a bees' nest which had been robbed by Africans a couple of days earlier. This seems to be an unusual habitat of the species.

*Campethera taeniolaema* Reichenow and Neumann. An adult and a juvenile male were collected together in gallery forest on Mahari ridge on August 1. This means a very considerable extension of the species' known range.

*Campethera abingoni annectens* (Neumann). Two specimens were obtained, viz. a male from near the lake shore on August 12 and a female from the foot of Kabesi ridge on September 2. The gonads of the latter example, which was moreover in company with a male and performing courtship display, were active. The classification of the species is fairly confused, the review by Clancey (1959), taking only the South African populations into account, does little to clarify the situation. Greatest similarities can be found with Angolan specimens (ssp. *annectens*), but the wing measurements are fairly large (121 and 123 mm. respectively) and agree with south Angolan but not with north Angolan specimens. Mrs. B. P. Hall has kindly looked at the specimens and agrees that they are best named as suggested above. White (1957) brings ssp. *annectens* up to Rukwa and Ufipa, but our record means an interesting extension of the known range.

*Anthus novaeseelandiae cinnamomeus* Rüppell. We obtained a small series of this species, three birds being taken at the lake shore and five in the mountains at levels between 6,500 and 7,800 ft. When studying them we have received much advice from Mrs. B. P. Hall for which we are most grateful. We have examined part of the material in British Museum and also the collections of Coryndon Museum, Nairobi, Naturhistoriska Riksmuseum, Stockholm, Sweden, and Malmö Museum, Sweden. The eight specimens are very dissimilar. Those from the lake shore are moderately pale, agreeing with specimens from many places in East Africa including Lake Naivasha, the type locality of ssp. *lacuum* Meinertzhagen. We were therefore initially in favour of placing them under this name. But White's paper (1957) on the interesting nature of the geographical and local variation in the East African populations of this species convinced us that it is better to use the name *cinnamomeus*, as suggested by him.

The five specimens from the mountains are very much darker, both on the upper and on the lower sides, and the light pattern on the lateral rectrices (Hall 1957) is nearly covered by pigments. In the Coryndon Museum we examined a specimen from North-eastern Belgian Congo, labelled as *Anthus latistriatus* Jackson, which was quite similar to our darkest bird. However, there is much in favour of dropping this name and including these melanistic birds, which occur in "pockets" all over East Africa, under the name *cinnamomeus*. We have sent our darkest specimen to Mrs. Hall who comments: "The specimen of *Anthus novaeseelandiae* is, as you note, an exceptionally dark bird, but can be matched here by some from Mlanje Mt., Nyasaland, and — speaking from memory — is like some collected by Prigogine in the Eastern Congo. These islands of exceptionally dark birds on the mountains are very difficult to deal with taxonomically, and I am inclined to agree with White that they should not be considered as a distinct subspecies. On the other hand, for purposes of discussion, it is quite useful to be able to refer to them as of a melanistic or *latistriatus* variety".

*Pseudoalcippe abyssinicus abyssinicus* (Rüppell). Two specimens obtained, both females with active gonads. We agree with Moreau (1951) that the subspecies *ansorgei* (Rothschild) is not valid.

*Pycnonotus barbatus tricolor* (Hartlaub) x *layardi* Gurney. Three specimens obtained of this ubiquitous species. Taxonomically the population was not at all easy to treat. We agree with White (1956) that *P. xanthopygos* (Hemprich and Ehrenberg) and *P. tricolor* (Hartlaub) are probably conspecific and may be united under the name *P. barbatus*. We have compared our specimens with topotypical material of the subspecies *tricolor* and *layardi* and found that our birds are inter-



mediate. According to White (*op. cit.*) this is best expressed in the way we have followed. There seems to be an interesting situation with long but fairly narrow zones of intermediate birds between different races of this species. Using more traditional taxonomy, our birds would be best named as *ssp. fayi*.

*Pyrrhurus scandens orientalis* (Hartlaub). A female with active gonads was collected in a gallery forest at about 3,700 ft. on August 5. The specimen can be matched with specimens from the Sudan and Northern Belgian Congo.

*Phyllastrephus flavostriatus tenuirostris* (Fischer and Reichenow). Three specimens were taken, all in gallery and mountain forests above 7,000 ft. The Kungwe-Mahari population of this species was separated by Moreau (1941) under the name *kungwensis*, but we find the differences very slight indeed and prefer including the birds under *tenuirostris*. Of all the birds of the area, supposed to be endemic, this is definitely the least differentiated (if at all).

*Arizelocichla nigriceps kungwensis* Moreau. The local population of this species of which we secured two specimens, is clearly different from other populations and definitely merits subspecific separation.

*Platysteira peltata* Sundevall *ssp.* Three specimens obtained. The green wash of the upper parts speaks well for referring the birds to the nominate race, but the wing measurements are at the upper limit for this form. Possibly, therefore, the population is intermediate between the nominate race and the subspecies *mentalis* Bodge.

*Dyaphorophya concreta kungwensis* Moreau. Two males obtained. With *Apalis argentea* this is best marked of all the endemic forms of Kungwe-Mahari. It was described by Moreau (1941), and the two species *D. concreta* and *D. ansorgei* (Hartert) have been reviewed by Macdonald and Usher (1952). The latter authors discuss the role of fading in the museum material, and we find some support for their opinion that the yellow colour on the underside is subject to gradual change from the fact that our birds are more strongly yellow than any specimens in the British Museum collection. A point which requires further investigation is the geographical variation (if any) in the colour of the eye-wattles. Mackworth-Praed and Grant (II:213) state that it is green in the subspecies *D. concreta graueri* Hartert, and Bannerman (VIII:403) gives "apple-green" for *D. concreta lomaensis* Serle.

No information is given for the *kungwensis* population in this respect, neither in the original description nor in the handbooks. It is, therefore, of great interest to note that both our specimens when freshly killed had extremely bright china-blue wattles—so bright, in fact, that in a female watched at close quarters in the field S.U. noted them as being white. However, in the killed birds, the blue colour vanished in a day and was succeeded by a dull sooty black. It remains to see whether the statements in the handbooks are valid for live birds or if they are founded on observations on museum specimens. If it is true that *kungwensis* alone has blue wattles, all the others having green, then there is yet another character emphasising the far-reaching differentiation in this population. As a matter of fact we find it difficult to decide whether *D. concreta kungwensis* is a good species or if it is a very well-marked subspecies. It is, however, in best agreement with the modern trend in avian taxonomy to retain a population such as this within a group of related forms, not to set it apart on its own.

*Cossypha bocagei kungwensis* Moreau. Two specimens obtained. Another of the endemic birds of Kungwe-Mahari, described by Moreau (1941). Recently Moreau and Benson (1956) have made it probable that the species *insulanai* to which the Kungwe-Mahari birds are referred by Mackworth-Praed and Grant (II:296) is conspecific with *C. bocagei* Finsch and Hartlaub. The closest relative to the Kungwe-Mahari population is *C. bocagei chapini* described by Benson (1955). The wing/tail ratio is an important systematic character in this species. It is being subjected to a separate study by S.U., the details of which will be published separately.

*Alethe poliocephala kungwensis* Moreau. Five specimens obtained. This is a very well-marked subspecies endemic to the area (Moreau 1941).

*Phylloscopus sibilatrix* (Bechstein). One specimen was watched at close quarters by S.U. on September 8. The locality was near the village Kibwesa on the lake shore. This seems to be a very southerly record for the species (cf. Mackworth-Praed and Grant II:385, Chapin III:473); perhaps it is the southernmost in Africa. The slender silhouette, the white under parts and the absence of wing-bar(s) in combination with the vivid green colour are conclusive, and it should be pointed out that the observer is extremely familiar with this species from Sweden, and that he has also studied all the other three *Phylloscopus* species (*viz.*, *trochilus* (Linné), *collybita* (Vieillot) and *bonelli* (Vieillot)) recorded in East Africa. The early time of the year was no real surprise to the observer who had witnessed at Ottenby Bird Station on Oland in the Baltic the early departure of this species which had already begun in the last

week of July. As a matter of fact, this seems to be the earliest of all common Swedish passerines to depart in numbers.

*Seicercus ruficapillus ochrogularis* Moreau. Two specimens collected of this endemic form which is very well-marked (Moreau 1941). It was abundant in gallery and mountain forests with much bamboo above about 6,500 ft.

*Apalis flavida golzi* (Fischer and Reichenow). Two specimens collected, both males with inactive gonads. As no subspecies is given in Mackworth-Praed and Grant (II:407) for the area in question it may be of interest to put on record that the local birds belonged to the ssp. *golzi*.

*Apalis argentea* Moreau. A brief note on the juvenile plumage and habitat of this species, endemic to the area, has been published elsewhere (Ulfstrand, in press).

*Nilaus afer nigritemporalis* Reichenow. One specimen obtained, a male with gonads inactive, on July 11, constitutes the only record of the species. We follow Chapin (IV:79) in considering *nigritemporalis* a subspecies of *afer*, since our specimen actually seems to be somewhat intermediate, although closest to *nigritemporalis*. An intermediate between two subspecies is not abnormal, but an intermediate between two species would be.

*Laniarius lühderi* Reichenow. Two specimens obtained, one of which is an adult male with active gonads and the other a juvenile bird. Kungwe-Mahari seems to be on the very borderline of the species.

*Bocagia minuta anchietae* (Bocage). Although we generally adhere to the principle that subspecies should not be determined in the field, in this case, it seems permissible to do so. We examined several specimens through binoculars at moderate distance and under good visibility conditions and are positive that there were no black markings on the mantle. Thus, the subspecies would be *anchietae*. Judging from the information in Mackworth-Praed and Grant (II:628), Kungwe-Mahari lies near the border-line between this subspecies and the nominate race.

*Anthoscopus caroli pallescens* Ulfstrand. See Ulfstrand (in press).

*Oriolus larvatus angolensis* Naumann. The classification of African orioles is a matter of divergent opinions (compare Mackworth-Praed and Grant II:665 *et seq.* and Chapin IV:117 *et seq.*). Within the species *larvatus* we follow Chapin in using the name *angolensis* for our specimen. This decision is based on the wing measurement (139 mm.) which, according to Chapin, is too great for *rolleti* which is restricted by him to more northern populations and is said to have a wing measurement of 121-133 mm.

*Oriolus nigripennis percivali* O. Grant. Three specimens obtained, viz. a male and female, both juveniles, on July 30 and an adult male on August 3. The wing measurements are 129, 129 and 141 mm. respectively. Due to the co-existence over a large area (Kenya, Uganda, Kungwe-Mahari of this form and the previous one, it seems astonishing that Chapin considers them conspecific, even though it is true that they seem to be fairly strictly isolated ecologically. However, without giving details, Chapin states that birds of intermediate characters between *angolensis* and *percivali* have been found in the Kikuyu Highlands in Kenya. The situation seems to be complicated, and more material and field records seem to be necessary for a definitive decision.

*Cinnyris regius anderseni* Williams. A well-marked endemic subspecies, recently described (1950). Common at altitudes above about 6,800 ft. in bamboo-rich gallery and mountain forests.

*Anthreptes collaris* Vieillot ssp. Two males collected on July 19 and 27. They have not been identified subspecifically. We find that they differ from ssp. *zambesiana* (Shelley) through being slightly deeper green on the upperside (fading in museum specimens?).

*Symplectes bicolor kigomaensis* Grant and Praed. Two females obtained on July 31 and August 30 in a gallery forest at about 6,900 ft. This subspecies has recently been described (1956) and we agree that the birds do differ from ssp. *amaurocephalus* (Cabanis). More cannot be said at the moment, awaiting the revision of the Ploceidae now in progress by Mr. R. E. Moreau.

*Spermophaga ruficapilla* (Shelley). This extremely skulking species has been previously recorded from Kungwe-Mahari and was also found by us.

*Lagonosticta rubricata congica* Sharpe. We obtained a male and a female of this species. The male, taken on July 25 at the foot of Mahari ridge, seems to be best referred to *congica* (a race which has been stated to occur in Kungwe-Mahari) but shows a tendency towards ssp. *haematocephala* Neumann.



### Concluding remarks

Although the zoogeography and ecology of the avifauna will be discussed elsewhere, partly because a second Kungwe-Mahari expedition from Oxford worked in the area in 1959 and brought together an important bird collection of some 60 specimens, some points of view may be added to the above selected list of more interesting faunistical records.

On the whole the general character of the bird fauna emerging in Moreau's paper (1943) has been substantiated by the present investigation. The number of endemic forms is on the whole unchanged: we take a critical position with regard to one of the forms alleged to be endemic (*Phyllastrephus flavostriatus tenuirostris* (*kungwensis*), and one new subspecies was found (*Anthoscopus caroli pallescens*). This latter form, however, differs from all the other endemisms by being a lowland species, not an ever-green forest inhabitant. It seems probable that this bird is not endemic for the area but has a wider distribution, a matter which may be established after fuller investigations in adjacent parts of Western Tanganyika Territory.

The *Brachystegia* woodland has connections eastwards, so no isolation between the local population and other populations is likely to exist. On the other hand, the large number of endemic forms in the gallery and mountain forests make it probable that these areas have been isolated during a very long time indeed. Investigation of the local occurrence of other groups of animals will perhaps throw light on the question of the ancient connections to other populations also in the species under consideration. A further analysis of the general distribution of members of the local mountain avifauna, in the light of knowledge gained since 1943, may also help elucidate the problem. In this work the clear West African affinities of the fauna, which exist also in mammals, must be borne in mind.

A record of particular interest is that of the mountain population of *Anthus novaezeelandiae*, the birds being strongly pigmented and referable to the "species" *A. latistriatus* of e.g. Mackworth-Praed and Grant (II: 69). This "variety" of *A. novaezeelandiae* was not previously recorded from Tanganyika Territory.

In the course of our work we covered most of the Kungwe-Mahari peninsula. However, due to lack of time, we did not investigate the northernmost part of the peninsula, including Mt. Kungwe itself. It is very fortunate that the second Expedition to the area, although not having ornithology among its chief objects, did some collecting exactly in the area not covered by us. A report on this collection will be published separately.

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(Received 15th March, 1959)

## NATURE NOTE

Dear Sir,

### Lucky Larvae

When I visited Mrs. Toni Nuti's Guest House on an island in the Kagera River (on the border between Uganda and Tanganyika) just before Christmas last year, I found on arrival part of the verandah barricaded off to protect a small mass, looking, as we all agreed, exactly as if one of the dogs or cats had been sick. On closer inspection this proved to be a mass of small semi-transparent worms all moving slowly together in a kind of jellified mass over the flag-stones of the verandah. Mrs. Nuti believed that they had come out of the hole in the stones made for the bolt of the door. She told me that the servants had been much excited and declared that the presence of these worms portended great wealth and many cattle for the owner of the house and that they should on no account be interfered with. Unfortunately, they failed to find a lodgement in Mrs. Nuti's house, and next morning, as they were clearly dead and drying up, I put the remainder in spirit and took them back to Makerere College. The Professor of Zoology thinks that they are some kind of fly larvae.

I should be interested to know if any of our readers have seen anything of the kind or heard any such legend about it.

Yours, etc.,

PRISCILLA M. ALLEN,  
Medical Library,  
Makerere College, Kampala.



## EAST AFRICAN SLUGS OF THE FAMILY UROCYCLIDAE—PART 2\*

By B. VERDCOURT, Ph.D., B.Sc., F.L.S.

### DENDROLIMAX

Heynemann in Malak. Blatt. **15**, 32 (1868)

Slugs without a dart sac; epiphallus with a long lime gland and a long flagellum. Ovotestis not lodged in the extreme posterior extremity of the visceral cavity as it is in *Atoxon*.

Genotype, *D. heynemanni* (Dohrn) described from W. Africa, Princes Island.

This is chiefly a West African genus. *D. continentalis* Simroth occurs in the Cameroons, *D. buchholzi* von Martens in the Gold Coast and *D. greeffi* Simroth was described from S. Tomé.

### Key to the species

1. Body deep grey with rounded buff spots on the mantle and flanks; base of oviduct large and glandular; vagina narrow; spermatheca oblong, half the length of the duct *D. osborni* 2
1. Differently coloured 2
2. Olivaceous with irregular pale reddish-brown spots; spermatheca ovoid bluntly narrowed at the apex, about half the length of the thick duct; penis, spermathecal duct and oviduct seemingly entering a glandular atrium or vagina *D. leprosus* 3
2. Spermatheca equalling or longer than the duct 3
3. Spermatheca fusiform, more than twice as long as the duct *D. continentalis*
3. Spermatheca about as long as the duct, ovoid and pointed; body buff, white or citron-yellow with oblique buff-brown stripes *D. greeffi*

[*D. osborni* Pilsbry in Bull. Am. Mus. Nat. Hist. **40**, 291, pl. 8, f.5, t.f.148 (1919)]

Body about 3.5 cm. long and 4 mm. wide; mantle 1.8 cm. long; ground colour deep grey, irregularly marked with rounded spots of buff on the mantle and flanks; sides also with dark grey lines. The genitalia are well-figured by Pilsbry. The most characteristic feature is the fact that a segment of the oviduct near its opening is enlarged and glandular. The spermatheca is oblong and half the length of the duct. The ovotestis is packed between the very large albumen gland and the large and sacculated uterus.

BELGIAN CONGO. Rutshuru, in riverine forest, leg. Bequaert.]

*D. leprosus* Pollonera in Boll. Mus. Zool. Anat. Comp. Torino **21** (543), 6 (1906); Pollonera in Il Ruwenzori, 189, t.3, f.1-5 and t.5, f.8 (1909)

An olivaceous slug 5.4 cm. long, ornamented with "reddish-brown ochraceous-whitish" (*sic*) irregular spots; head blackish, mantle with subpolygonal reticulation, back obtusely keeled; sole pale.

UGANDA. Fra Kijemula e Madudu (Abruzzi Exped.).

Pollonera compares this species with *D. continentalis* Simroth but states that it is larger and has different genitalia.

*D. sp.*

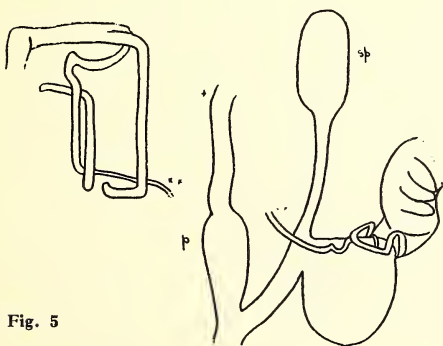
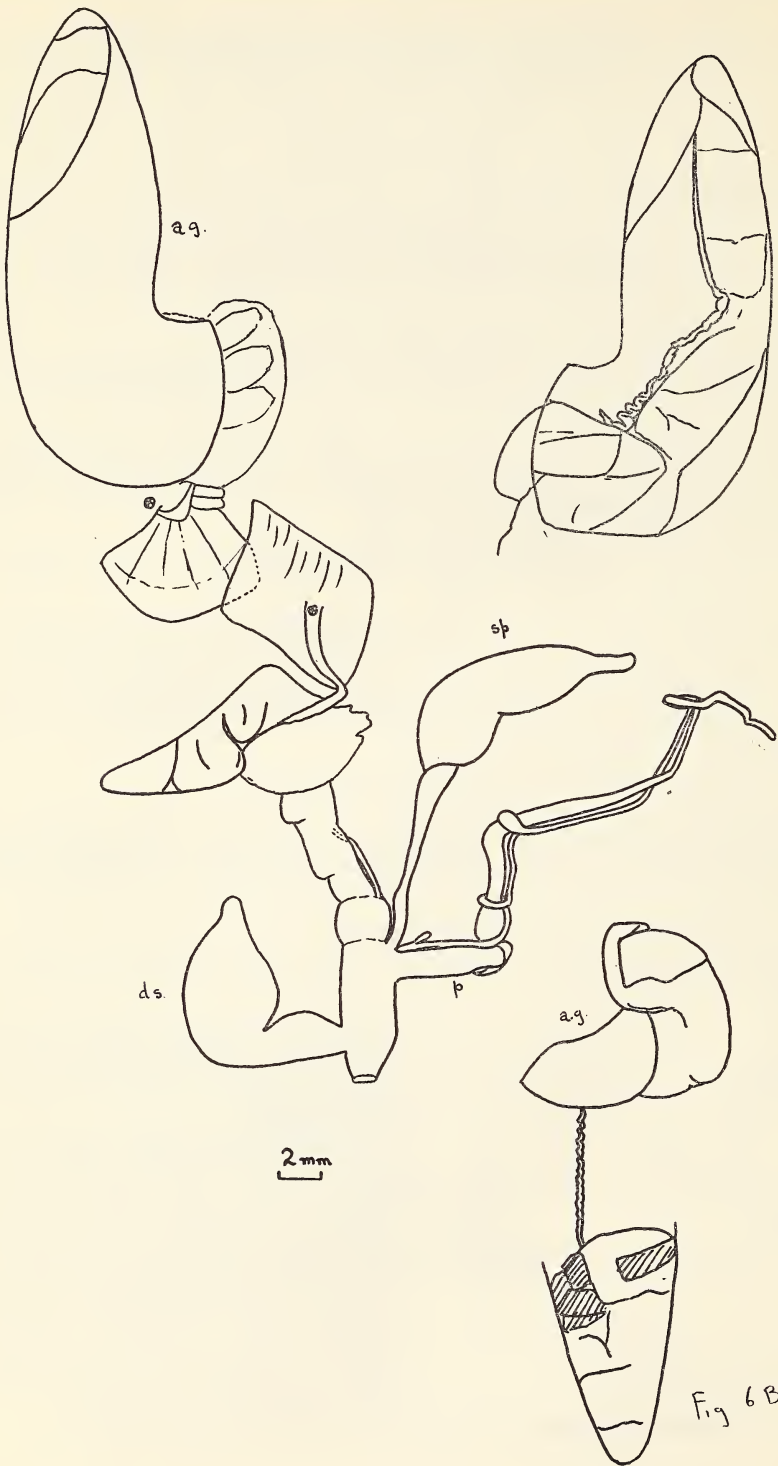


Fig. 5

A single specimen of a species of this genus was found at Thika, Kenya, by the author. Unfortunately the specimen has disintegrated owing to poor preservation and only my original sketches remain.

The ground colouration is grey and there are white markings. The white parts are thick and warty. The base of the oviduct is swollen and glandular; the oblong-ovoid spermatheca is about the same length as its duct and about three times as wide, very blunt or subtruncate above. Further specimens are needed but have so far eluded several searches. This species is obviously closely related to *D. osborni* and presumably new. The anatomy is shown in the diagram in Fig. 5. This is exceedingly rough and not in any way to scale. It may serve for future recognition of the species.

\* Continued from Journ. E. Afr. Nat. Hist. Soc. **23**, 209 (1960).





The specimen was found on the steep walls of the Chania gorge at Thika, about 27 miles north of Nairobi. The gorges nearby are deep and contain swiftly flowing small rivers which are bordered by rich but narrow belts of riverine forest, with such typical trees as *Newtonia buchananii*. Several species of mollusc live in this small belt of forest including *Maizania magilensis* (Craven), *M. volkensis* (von Martens), *Edouardia rutshuruensis* (Pilsbry) var., *Rhachidina usagarica* (Sm.), *Krapfiella mirabilis* Pr., *Euonyma aff. magilensis* (Craven), *Trochonanina crassiplicata* (Pr.), *T. elatior* (von Martens), *Trichotoxon thikense* Verdcourt and *Tayloria urguessensis* (Pr.) var. *subangulata* Verdcourt. Parts of the gorges have steep, damp rocky walls and mollusca are often found on these.

## BUKOBIA

Simroth in Die Nacktschnecken Ost-Afrikas 11 (1897) (= *Stuhlmannia* Simroth in S.B. naturf. Ges. Lpz. 19-21 (1892-4), 59 (1895) preoccupied)

*Microcycylus sensu* Pollonera non Simroth

Dart sac small, round or ovoid, without darts, situated on the left of the atrium, usually without retractor muscles or with small lateral retractors only. Epiphallus as in *Atoxon*, with a long lime gland and a rudimentary flagellum.

Genotype, *B. picta* (Simroth)

Note: In one figure of *B. picta* Simroth figures a dart sac retractor but in another it is not shown; presumably the first is erroneously drawn.

### Key to the species

1. Dart sac without retractor muscles . . . . . 2
1. Dart sac with small lateral retractor muscles . . . . . 4
2. Spermatheca narrowly fusiform, merely a widening of the duct . . . . . 3
2. Spermatheca cylindrical-ellipsoidal about as long as the duct but four times as wide; body cream-coloured, densely marbled and spotted with brown . . . . . *B. cockerelli*
3. Mantle sides with one band, dart sac globular (at least as shown in the original reference) . . . . . *B. picta* and *B. hoesemanni* (see text)
3. Mantle sides with two bands; dart sac ovate-acuminate bent at right angles to its basal part or stalk . . . . . *B. kikuyuensis*
4. Body golden-ochraceous with marked bands; described from an immature specimen . . . . . *B. signata*
4. Body earth-coloured with inconspicuous bands . . . . . 5
5. Penis shorter, spermatheca longer than its duct; flagellum small . . . . . *B. incerta*
5. Penis longer, spermatheca shorter than duct; flagellum large . . . . . *B. modesta*

[*B. cockerelli* Pilsbry in Bull. Am. Mus. Nat. Hist. 40, 294, pl. 8, f.4, t.f.149 (1919)]

A cream-coloured slug 3.7 cm. long, densely marbled with cinnamon-brown and blackish brown. The dart sac is sub-globular, about 3 mm. long; the spermatheca is sausage-shaped with a slightly longer duct. The ovotestis occupies the posterior extremity of the visceral cavity. This species which is fully illustrated in Pilsbry's paper differs from *picta* in its colour and differently shaped spermatheca.

BELGIAN CONGO. Ruwenzories, Butagu Valley, leg. Bequaert.]

***B. picta*** Simroth in Die Nacktschnecken Ost-Afrikas 11, t.2, f.10 and t.3, f.1 (1897); Simroth in Rev. Suisse de Zool. 20, 36, t.3, f.3 a-c (1912)

*Stuhlmannia picta* Simroth in S.B. naturf. Ges. Lpz. 19-21 (1892-94), 59 (1895)

Body 1-3 cm. long, yellow-buff with orange-brown stripe on the mantle and hind body or almost devoid of stripes or more or less spotted; the mantle is often heavily spotted as well as striped; the stripes sometimes break up into big spots. The original figure given by Simroth shows a dart sac without retractor muscles but the figure given much later in Rev. Suisse de Zool. shows a retractor. Whether or not these figures represent distinct species I do not know. The spermatheca is long and narrow merging with the duct.

TANGANYIKA. Bukoba, Bussiro, leg. Stuhlmann.

***B. hoesemanni*** Simroth in Reise in Ostafrika A. Voeltzkow 1903-5, Wiss. Ergebn. 2, 607, t.26, f.7, t.f.16 (1910)

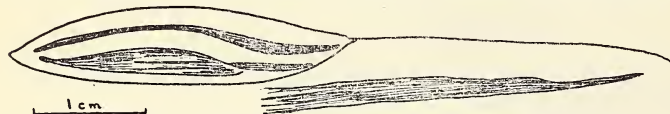
Body 3 cm. long, pale leather-coloured with one rust-coloured band on each side of the mantle and hind body. The plate shows an ochre slug with brown bands. The spermatheca

appears to be very similar to that of *B. picta*. I am unable to follow the distinctions given by Simroth to separate the latter from this present species. It appears that the dart sac is plicate internally in *B. picta* and that in *B. hoesei* the folds are shaped about a flap-shaped excitatory organ. No retractor muscle is shown.

TANGANYIKA. 'Bukenza oder Buhumbi am Südufer des Viktoria Nyansa', leg. Hoesei.

**B. kikuyuensis** Urban and Verdcourt in Proc. Malac. Soc. 34, 106-111. pl.6, t.f.1-9 (1960)

Judging from the description it seems likely that this species is similar to *B. signata* (Pollon.). In that species, however, the dart sac is described as having five retractors, moreover, the present species lacks the dorsal interrupted lines.



Body very pale creamy-buff, yellow-brown or yellow-ochre, tinged pinkish-white. Hind body carinate only at extreme

end; keel and top of dorsum yellowish-white, side parts of body with longitudinal grey lines. The sides of the body also each bear a grey-brown stripe; these stripes are darker, narrower and pointed posteriorly. There are also a few marks in the grooves above the stripes. Front part of the body near the head very pale. Fringe pale whitish-brown. Mantle more or less the same colour as the body, pale bistre, buff, yellow-brown or yellow-ochre, granular, shagreened, with two grey-brown stripes on either side. The inner stripes are distinctly narrower and darker anteriorly but the outer ones are fainter and wider anteriorly; these stripes contain white granules; in the middle of the mantle there is sometimes a faint trace of two bands of pale spots; this central area is tinged pinkish-white. There is a vague V-shaped mark at the posterior end of the mantle. The front end of the mantle is drawn out when the animal is in motion. Tentacles brownish-bistre or pale grey-brown. Sole tripartite, pale yellow-brown or bistre, the central part with blue-grey lines showing through in life. (Fig. 7.)

Dimensions:—

Length of body outstretched, 5-6.2 cm., breadth, 1-1.3 cm. Length of body contracted, 2.5 cm., breadth, 1 cm. Length of mantle contracted, 1.9 cm. Pulmonary aperture situated half-way along the mantle, the distance between the pallial and pulmonary apertures being 9 mm.

The anatomy resembles that of *B. picta*. The dart sac, however, is ovoid, acuminate at the apex and twisted at right angles to its lower portion or stalk, the two portions being 6 x 3.5-4 mm. and 3 x 2.5 mm. respectively. There are no retractor muscles. The spermatheca is elongate, sausage-shaped, longer than its narrow duct. The spermatheca varies in size, 9-16 mm. long and

3.5-4 mm. wide on a duct 7-9 mm. long. The largest measurements refer to spermathecae swollen with spermatophores. The anatomy is shown in Figs. 6 and 7.

In some specimens the albumen gland is very much more developed than in others which nevertheless appear to be fully adult. These conditions presumably coincide with certain sexual phases. In the specimen collected at Muguga North by P. J. Greenway, the genitalia are huge and take up quite three-quarters of the visceral cavity, the albumen gland itself almost filling the posterior half of the cavity and quite concealing the liver.

Other specimens collected at Limuru by D. C. Thomas of the same length and with the genitalia apparently mature have a very small albumen gland taking up only 1/5 of the cavity and not concealing the liver which is much larger than the gland and clearly visible. The ovotestis is right at the end of the cavity but in one form it is quite separate from the albumen gland whereas in the other it is beneath the gland.

The Limuru specimen had three spermatophores in the spermatheca; they are spiral, slender, trigonous in section, 6-8 mm. long. The eggs are globular, pale amber (in spirit), 3-3.5 mm. long.

KENYA. Muguga, 18 miles west of Nairobi, W. Wilkinson (type in Berlin Museum); same locality, on a piece of chewed sugar cane, leg. B. Verdcourt (sent to S. Jaekel, Zoological

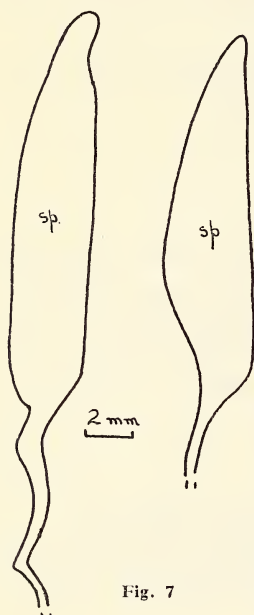


Fig. 7



Museum, Berlin). Muguga North, about 21 miles west of Nairobi, leg. P. J. Greenway (an ochre-coloured specimen with only the vaguest traces of bands near the hind end of the body and on the mantle). Ngong Hills, leg. R. D. Brown. Further specimens since collected at Muguga, leg. B. Verdcourt.

**B. signata (Pollonera)**

*Urocyclus (Microcyclus) signatus* Pollonera in Ann. Mag. Nat. Hist. (8), 8, 331, pl. 8, f.1 and 2 (1911)

The following is directly translated from Pollonera's latin. Pale ochraceous-golden, paler in front, zoned with blackish-chestnut; mantle granulate, rounded behind; pallial hole large. Pulmonary aperture slightly post-median, pallidly margined; mantle ochraceous-golden, slightly fuscous in the middle, brown-spotted, bizonate at the sides, the principal zone the more obscure. Back obtusely carinate, the keel evanescent towards the mantle; obscurely unizonate on each side and above with many interrupted lines. Sole pale, median part paler. Dorsum 1.25 cm. long, mantle 9.5 mm. long and sole 2.6 cm. long. The reproductive organs of the two specimens found were very undeveloped; five retractors are shown attached to the dart sac.

KENYA. Mt. Kenya, montane forest, 9-10,000 ft., leg. R. Kemp.

**B. modesta (Pollonera)**

*Microcyclus modestus* Pollonera in Boll. Mus. Zool. Anat. Comp. Torino 21 (543), 3 (1906); Pollonera in Il Ruwenzori, 186, t.2, f.4-5 (1909)

Earth-coloured slug, inconspicuously zoned with brown. Mantle minutely granular with an evanescent brown zone on both sides and two faint zones in the middle. Pallial aperture short and narrow; pulmonary aperture a little post-median. Back minutely rugose, distinctly carinate but keel not raised, with inconspicuous brown zones on the sides. Dorsum 2.4 cm. long, mantle 1.5 cm. long, sole 4.5 cm. long.

UGANDA. Fra Kijemula e Madudu (Abruzzi Exped.).

**B. incerta (Pollonera)**

*Microcyclus incertus* Pollonera *op. cit.* 4 (1906); Pollonera in Il Ruwenzori, 186, t.1, f.15-16 and t.2, f.1-3 (1909)

Earth-coloured slug, mantle granular, only very palely and inconspicuously bifasciate with very pale brown, bands very narrow; pallial aperture large, ovate-rounded, pulmonary orifice very slightly antemedian. The back is very slightly rugose, very obtusely carinate, the keel extending about three-quarters of the way along the back. Dorsum 1.8 cm. long, mantle 1.55 cm. long, sole 4.4 cm. long.

This species is said to differ from the last by its smaller, less rounded dart sac and shorter spermathecal duct.

UGANDA. Toro, near Fort Portal (Abruzzi Exped.).

Notes on Pollonera's species of *Microcyclus*

Pilsbry (1919) indicated that he thought that these were *Bukobiae* but the figures show distinct lateral retractors; apart from these, however, the anatomy is very similar to that of *Bukobia picta* and they are perhaps best referred to that genus. The presence or absence of a few small muscles does not seem to be much of a generic character. As I have mentioned before one of Simroth's drawings of the anatomy of *B. picta* shows muscles. *Microcyclus* was proposed by Simroth (Abh. Senck. naturf. Ges. 19, 303, t.1, f.12-20 (1896)) for a species from Togo in West Africa namely *M. baumanni* Simroth. This species does not resemble very closely the slugs which Pollonera has referred to *Microcyclus*. *M. baumanni* differs very decidedly by its long dart sac and spherical atrium. Thiele defines *Microcyclus* as follows:— Atrium spherical containing a glans penis; the dart sac has several lateral retractors and inner ridges; its end is not evidently glandular. The thickened end of the oviduct and the narrow duct of the spherical spermatheca open into the tubular dart sac near its apex. Thiele treats it as a subgenus of *Urocyclus* as also did Pollonera in his later (1911) paper.

## UROCYCLUS

Gray in Proc. Zool. Soc. Lond. 1864, 250 (1864)

Elisa Heynemann in Jahrb. Mal. Ges. 10, 40 (1883)

Dart sac present with retractor muscles. Epiphallus with long lime gland and rudimentary flagellum.

Subgenus *Urocyclus sensu stricto*

Dart sac powerfully developed with apical retractors. Epiphallus with a long gland. Mainly distributed along the Tanganyika coastal areas, the East African Islands and the Mascarene Islands.

## Key to the species

1. Spermatheca and duct over twice as long as the length of the penis and epiphallus not unravelled . . . . . *U. bussei* 2
1. Spermatheca and duct shorter than the penis and epiphallus not unravelled . . . . . *U. ehlersii* 3
2. Slug yellow with distinct orange-yellow spots . . . . . *U. ehlersii* 3
2. Slug not coloured as above . . . . . *U. roebucki* 4
3. Spermatheca and duct about twice as long as the dart sac; slug blueish-white with yellow-ochre spots becoming more or less solid on the back and the middle of the mantle; or uniform buff with small dark spots . . . . . *U. roebucki* 4
3. Spermatheca and duct about equal to the dart sac. . . . . *U. rufescens*
4. Animal much marked with red or red-brown; dart sac with seven lateral retractor muscles as well as apical one . . . . . *U. rufescens*
4. Animal white marked with black to a varying degree sometimes almost entirely black; dart sac with two weak lateral retractor muscles . . . . . *U. variabilis*

**U. rufescens** Simroth in Abh. Senck. naturf. Ges. 18, 298, t.1, f.2-4 and t.2, f.7 (1894)

Young animal grey with two dorsal white stripes and black pallial stripes. The mantle of the adult has a median band and two side bands that coalesce anteriorly, all red or red-brown in colour; the dorsum is heavily marked with radiating red bands sometimes cut by a white lateral stripe on either side; sometimes, however, this stripe is lacking and the red marks are continuous. There is a pallid mark around the shell. Animal about 4.7 cm. long. Dart sac very elongate with many retractors. Spermatheca subglobose with duct over twice as long as itself; the two together about equalling the dart sac. Lime gland or second appendix very long.

TANGANYIKA. East Usambaras, Derema, leg. L. Conradt.

**Urocyclus variabilis** Verdcourt sp. nov.

This species is variable in the extent of the markings. The three specimens seen alive were all obviously conspecific. In two specimens the keel and caudal gland are white; the flanks below the mantle entirely white and the posterior parts of the flanks marked with black ridges and speckles. The mantle has the posterior margin sinuate; ground colour whitish, a lateral band of black on each side, the central area between filled with dense black and white speckles. The pallial hole is very minute or not perceptible but that area is white margined with black. The pulmonary aperture is 7 mm. from the anterior margin. The head is grey-brown. The animal is 3.9 cm. long and 8.5 mm. wide; the mantle is 1.3 cm. long. Another specimen of similar size was almost entirely black save for the white sole, tiny white spots on the basal edge of the mantle and the base of flanks white, with white spots above on the black areas.

The shell is relatively large, more or less membranous, about 4.5 mm. long and 3 mm. wide. Dart sac cylindrical, about 5 mm. long furnished with a powerful apical retractor and with two small lateral ones. The spermatheca is small, ovoid, 1.5 mm. long and 1 mm. wide, duct slender about 2.6 mm. long. See Fig. 8.

KENYA. Kwale District, Marenji Forest Reserve on the Mrima Road joining the coast road and the main Kwale-Tanga road, leg. B. Verdcourt (a pale specimen

chosen as holotype, in Coryndon Memorial Museum, Nairobi).

This species does not agree with any of the previously described species in *Urocyclus* s.s. but it is apparently related to *U. rufescens* Simroth.

**U. bussei** Simroth in Reise in Ostafrika A. Voeltzkow, 1903-5, Wiss. Ergebn. 2, 606, t.26, f.13, t.f.14 (1910)

Slug about 2.5 cm. long, mantle ochraceous,

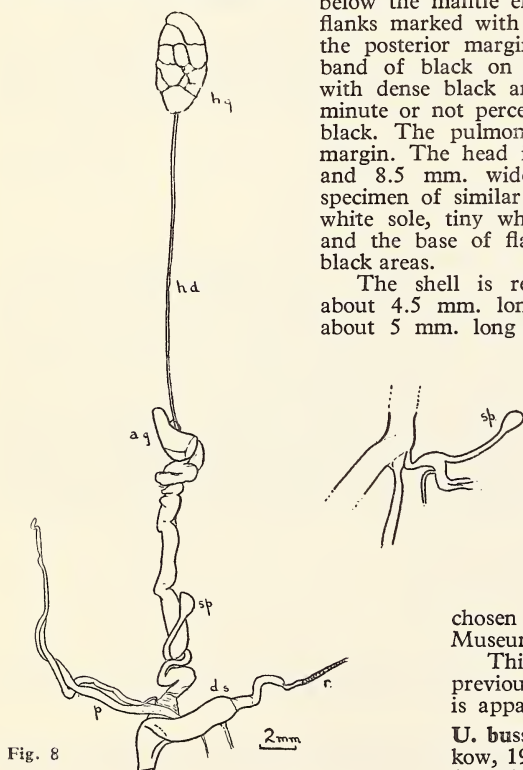


Fig. 8



margined with a narrow zone of dark brown all round followed by an exterior zone of white. Dorsum keeled blue-tinged with brown and fine dark-brown oblique lines or very strong lines. Keel ochraceous, margined with dark brown. Genitalia juvenile. Simroth shows the spermatheca as a slightly spatulate broadening of the very long duct. The relative lengths of the various organs may, of course, be quite different in an adult specimen.

**TANGANYIKA.** Bei Seliman Mamba, in *Sorghum* field, leg. W. Busse.

In the description of this present species Simroth mentions that Busse collected a *U. auriantiacus* and refers to the paper which contains the description of *U. ehlersii*; he presumably altered the name.

**U. ehlersii** Simroth in Zeitschr. Wiss. Zool. 82 (Festschrift), 496, t.29, f.1-7 (1905)

Slug about 3.8 cm. long, yellow with numerous orange-yellow flecks. The figure given by Simroth depicts abnormal genitalia.\* The tubular dart sac has a strong apical retractor but no lateral retractors are figured; this sac, the penis, the oviduct and the atrium all open into a large quadrate sac which Simroth has called the spermatophore sac and figured containing a spermatophore. The spermatheca proper is ovoid with a slightly longer duct.

**TANGANYIKA.** Kwa Sikumb, auf Grassholmen gefangen, leg. W. Busse.

**U. roebucki** Simroth in Reise in Ostafrika A. Voeltzkow 1903-5, Wiss. Ergebn. 2, 595, t.26, f.12, t.f.5 (1910)

Slug about 4 cm. long, whitish with a blue tinge, covered with yellow-ochre spots becoming more or less solid on the dorsum and middle of the mantle. Some specimens are uniform buff or have small superimposed dark brown spots. Spermatheca globular with a duct about three times as long. Several retractors are shown attached to the dart sac.

**ZANZIBAR.** Pemba Island, leg. Voeltzkow.

Subgenus *Mesocyclus* Pollonera in Boll. Mus. Zool. Anat. Comp. Torino 21 (543), 3 (1906) and in Il Ruwenzori, 184 (1909)

Pollonera proposed this subgenus for four species (mentioning *U. zonatus* first) and defined it by saying that the dart sac (prostate gland, mucous gland) is less evolved than in subgenus *Urocyclus* and that it lacks the strong terminal retractors; it possesses only numerous lateral retractors. By this lack of terminal retractors *Mesocyclus* approaches *Microcylus* but the dart sac is much more slender in *Microcylus*. Thiele says "blindsack" with lateral retractors; epiphallus with a narrow and a long appendix". Pollonera adds: perhaps likewise it will be necessary to consider *Microcylus* as a subgenus of *Urocylus*.

### Key to the species

1. Spermatheca folded into a U shape; duct three times as long; mantle three-banded (the duct has a small excrescence near the middle but this may be abnormal) . . . . . *U. zonatus*
1. Spermatheca not so folded . . . . . 2
2. Spermatheca elongated, convoluted, double the length of the duct; mantle black-spotted at the edge . . . . . *U. varipunctatus*
2. Spermatheca not as above; mantle more or less 2-4 zoned . . . . . 3
3. Spermatheca ovoid, sharply pointed, half the length of the duct . . . . . *U. subfasciatus*
3. Spermatheca elongate, gradually passing into the short duct . . . . . *U. tenuizonatus*

**U. zonatus** Pollonera op. cit. 1 (1906) and in Il Ruwenzori, 183, t.1, f.11-14 and t.5, f.1 (1909)

Animal pale brown, paler in front, distinctly zoned with chestnut-brown on either side of the body; mantle three-banded with brown, granular reticulate and margins spotted; the median band is furcate behind and splits up into spots in front. Hind body rugose, carinate and attenuated behind. Dorsum 17mm. long. mantle 11 mm. long and sole 28 mm. long. The spermatheca is a cylindrical elongated sac bent in the shape of a U; the duct three times the length of the sac with a small excrescence near the middle. These may not be constant characters, of course.

**UGANDA.** Toro, near Fort Portal (Abruzzi Exped.).

**U. tenuizonatus** Pollonera op. cit. 2 (1906) and in Il Ruwenzori, 183, t.1, f.6-10 and t.5, f.3 (1909)

A very pale-brown slug interruptedly and inconspicuously zoned with brown. Mantle small, minutely granular, inconspicuously zoned with four brown lines, lateral zones continuous, inner ones interrupted and not reaching the anterior margin. Back a little rugose; obtusely keeled

\* This paper is about slugs with deformities.



behind, lateral zones of brown interrupted and very inconspicuous. Dorsum 22 mm. long, mantle 11.5 mm. long and sole 43 mm. long. Spermatheca narrowly cylindrical gradually passing into a short duct.

UGANDA. Toro, near Fort Portal (Abruzzi Exped.).

*U. subfasciatus* Pollonera *op. cit.* 2 (1906) and in Il Ruwenzori, 184, t.1, f.1-3 and t.5, f.6 (1909)

A brown slug with one blackish band on either side. Mantle minutely granular distinctly zoned with blackish on either side, middle obscure. Back rugose, inconspicuously zoned with blackish on either side; obtusely keeled but keel very weak just behind the mantle. Dorsum 16 mm. long, mantle 11.5 mm. long and sole 35 mm. long. Spermatheca ovoid with tapering triangular point, half the length of the distinct duct.

UGANDA. Toro, near Fort Portal (Abruzzi Exped.).

*U. raripunctatus* Pollonera *op. cit.* 3 (1906) and in Il Ruwenzori, 184, t.1, f.4-5 (1909)

A unicolorous earth-coloured slug, mantle black-spotted at the edges only, minutely granular. Back rugose, tuberculate, obtusely keeled, the keel becoming evanescent anteriorly. Dorsum 25 mm., mantle 17 mm. and sole 47 mm. long. Spermatheca elongate fusiform, convoluted, duct about half as long. Flagellum long.

UGANDA. Toro, near Fort Portal (Abruzzi Exped.).

(To be continued)

(Received 12th February, 1960)

#### CAPTIONS

Fig. 5. *Dendrolimax* sp. nov. Kenya, Thika, Chania Gorge. B. Verdcourt (not to scale)

Fig. 6. *Bukobia kikuyuensis* Urban and Verdcourt. (A) Kenya, Muguga, W. Wilkinson. Genitalia. (B) Kenya, Limuru, D. C. Thomas. Part of the genitalia, showing the albumen gland and hermaphrodite gland.

Fig. 7. *Bukobia kikuyuensis* Urban and Verdcourt. (A) Kenya, Muguga, B. Verdcourt. Pattern diagram. (B) Limuru, D. C. Thomas. Spermathecal sac. (C) Muguga, B. Verdcourt. Spermathecal sac.

Fig. 8. *Urocyclus variabilis* Verdcourt sp. nov. Kenya, Kwale District, Marenji Forest near Mrima, B. Verdcourt. Genitalia.

## A NESTING COLONY OF AVOCETS AT LAKE MANYARA, TANGANYIKA

By

A. M. MORGAN-DAVIES, F.Z.S.

*Park Ranger, Tanganyika National Parks.*

On July 19, 1959, four adult Avocets, *Recurvirostra avosetta* Linn., were seen feeding on the north-west shore of Lake Manyara and further search revealed a large flock of about 400 spread out upon the soda flats in the north-east corner of the lake. This latter area is, during the dry period of the year, the first to dry up and the most susceptible to fluctuations in water level, also it provides ideal feeding grounds for the resident and palaeartic visitors along the Great Rift Valley route.

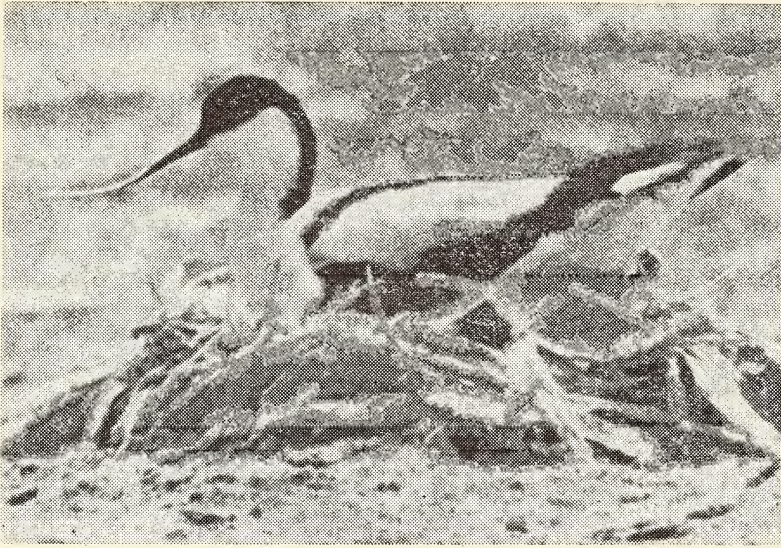
Although fed by numerous small perennial fresh-water streams that emerge at various levels from the Rift wall, the lake itself is always alkaline and on evaporation leaves large expanses of soda-covered mud-flats. During July, 1959, the north-east corner of the lake was at a level that exposed small bare areas of soda, up to 50 yards square, separated from each other by up to 100 yards of very shallow, highly alkaline water and mud. It was upon these low uncovered areas of soda that 14 pairs of Avocets were found, for the first time at Lake Manyara, building, laying and incubating their eggs.

Most of the nests were made up from the feathers of the Lesser Flamingo (*Phoeniconaias minor*), resident at the lake in thousands during June and July, 1959, and whose shed feathers formed an almost solid carpet two feet wide for a distance of nearly five miles down the western shore of the lake. These feathers had been collected and formed a solid mound which could be removed intact from the ground, having been cemented together by reason of saturation with soda. The pink coloration in most feathers soon lost its brilliance, and by the time the eggs had been deposited the nests blended in with the white soda surroundings making them almost impossible to be seen from more than 100 yards away.

The base diameter of most nests was approximately 16 inches rising about three inches to a top diameter of eight inches. The eggs were deposited upon this build-up in a shallow depression about one to two inches deep and five inches in diameter. There was little or no effort to line the inside of the nests which soon became encrusted with a thin layer of soda to which the eggs often became firmly attached. This layer of soda is deposited in the nest and upon the eggs by the incubating parent whose lower breast and abdominal feathers are often damp with the highly alkaline water of the lake. In fact, the deposit of soda on the eggs was often so heavy that it was impossible to discern their true coloration and even after they had been cleaned with a damp cloth, they were almost permanently stained with a thin, cloudy-white film.

Mackworth-Praed and Grant (1957) give the average egg measurements as about 50 x 35 mm. This compares well with the six clutches measured from this colony of which the average measurements were 50.5 x 35.5 mm. (45.5 x 35.0 — 53.0 x 35.0). Apart from a 7.5 mm. difference in length between the largest and smallest egg





Avocet on nest, Lake Manyara, Tanganyika. The nest is largely composed of the feathers of the Lesser Flamingo.

measured, little variation in size and shape was noticeable, though some eggs were slightly more pointed at the lower end. The majority of nests contained four eggs, others only three.

Two definite, and easily discernible, colour variations were to be found in the eggs although each clutch conformed to one or other colour type. One variation was a very pale clay, lightly speckled with small spots of black, various shades of brown, and pale violet. The second was a very much darker putty colour with larger blotches of black, various shades of brown, and pale violet. The violet markings in both cases were in the form of paler cloudings rather than of well-defined blotches.

Owing to lack of opportunity to spend any considerable time in observing the behaviour of the incubating parents, the following observations are not as extensive as I would have wished. On July 20 a hide was erected overlooking two nests. During this procedure no signs were noticeable of any effort to lure away myself or my assistant. The two parent birds either remained standing in the soda mud about 50 yards from their nests, or flew overhead, occasionally calling. It was soon obvious which bird owned which nest.

An intruder approaching too closely to another nest was soon driven away by the owner, and from a sufficient distance to prevent disclosure of the actual position of the nest to anyone who might be interested in it. Three hours were spent by both birds walking in circles around the spit of land on which the nests and hide were erected. However, one bird finally approached her nest and settled down to incubate with much bobbing of head (probably a sign of nervousness) in a fashion very similar to that of many of the waders. The slightest disturbance drove her off and some minutes elapsed before she returned. During the two periods between 12 noon and 2 p.m., and from 4 p.m., when the north-east wind was blowing strongest, both birds were bolder in their approach to their nests and remained incubating longest.

The presence of Grey-headed Gulls (*Larus cirrocephalus*) had a most demoralising



effect on both birds, although they were not actually seen to drive off the intruders; these were, however, kept at bay by the numerous Kittlitz's Sand-plovers (*Charadrius pecuarius*) which I suspect were also nesting in the immediate vicinity.

On August 3, another visit was made to the colony when almost total desertion of the nests by the parent birds was the first indication that something was amiss. Practically every nest had been robbed and the few that had not, had been abandoned: the full clutch from only three nests showed signs of successful breeding, although the young birds were not to be seen. Several eggs were still stuck to the inside of the nests by means of the film of soda already mentioned; a large hole on top of each egg indicated how the contents had been removed. Other eggs similarly plundered were also found lying a few feet from the nests. No sign could be found of a four-legged predator and my earlier observations point to the Grey-headed Gulls as the most likely culprits.

#### Reference

1957. MACKWORTH-PRAED AND GRANT: Birds of Eastern and North-Eastern Africa.

(Received 19th January, 1960)

## AN UNUSUAL THREAT DISPLAY OF THE AFRICAN ELEPHANT

By

C. A. SPINAGE, F.Z.S.

Whilst visiting the Queen Elizabeth National Park in Western Uganda during December, 1959, the writer was fortunate in witnessing an unusual threat display by a young bull elephant (*Loxodonta africana*). Almost every herd that the writer came across at this time showed signs of excitement and frequent charges were made at the vehicle, possibly because it was a peak period for mating. Although elephants seem to breed all the year round, Perry (1953) concluded that they had a period of greater intensity from December to March.

Approaching one small herd quite closely, a young bull showed resentment at the presence of the vehicle and went through all the customary motions of threat without, however, actually making a determined charge. Even the typical sideways swing of the head as it sights its object with one eye, was not followed up with a charge. Whilst going through such motions it suddenly knelt down on all fours, and lifting one fore-leg, pawed the air with it. At the same time the mouth was held open with its trunk curled back over its head, and its male organ was also extruded.

The African Assistant Warden who was accompanying the observer stated that he had seen a similar display once or twice before, but as so few people appear to have done so, usually moving off at the first signs of aggressiveness on the part of an elephant, it seemed worthwhile recording.

Being so engrossed in this strange display, the writer omitted to take a photograph of it.

#### Reference

PERRY, J. S. (1953). The reproduction of the African elephant, *Loxodonta africana*. Philosophical Transactions of the Royal Society. B. Vol. 237, 93-148.

(Received 25th April, 1960)

## A NOTE ON THE BEHAVIOUR OF THE TREE HYRAX

By

VENN FEY

With reference to Mr. J. B. Sale's article in Vol. XXIII, No. 5, January 1960, of this journal, and in the hope of adding to the information on the little-known habits of the Tree Hyrax, *Dendrohyrax*, I offer the following for what it is worth. Most of my observations were from a close study of an adult male that was kept as a pet, and which did in fact once belong to Lady Baden-Powell.

**DIURNAL HABITS**—This animal took up residence in the roof of the house, and was little seen during daylight hours. It did, however, come out to bask on an exposed stone prominence adjacent to its roof entry on most sunny days. Occasionally, and usually when guests were present, it would appear at tea-time and would become most active, particularly in its demand for cake. I imagine that on such occasions it was attracted by the drone of voices beneath the place in the roof in which it slept. A bush-baby we kept, and which also lived in the roof, frequently behaved in the same way.

**NOCTURNAL HABITS**—This animal usually appeared shortly after the wireless was turned on for the nine o'clock news. Sometimes it would appear sooner, but it would sit motionless on a chair or sofa, and to all outward appearance seemed to be in a coma.

Once the news broadcast commenced it would suddenly become active, and as a preliminary it would run to and fro along the back of the sofa, jump to the floor and scamper across to an arm chair, showing every sign of intense interest.

Having selected a perch it would then squat and slowly lower its head until its chin was touching the perch. At the same time the white hairs on its dorsal gland would slowly rise until they were erect, and the gland would swell into a visible "bump" on its back, and would appear to excrete an oily substance.

At this juncture its jaws would slowly open until the teeth were bared, and seen in this position the general appearance of the animal was both fascinating and macabre. I never made up my mind as to whether it was displaying exquisite pain or ecstasy. Possibly an admixture of both.

Then, with jaws fully extended, and dorsal gland fully distended, it would suddenly break into its characteristic ear-splitting call. If the wireless was still on it sometimes repeated the performance, and invariably its display would be followed by a pronounced erection of the penis. On the completion of this it would lick its lips and hop about as if nothing had happened, almost as if it heartily disapproved of emotional outbursts.

As soon as the wireless was turned off it would scamper away through the door into the night.

This animal became most attached to members of the household, particularly to my cousin, and it frequently came into his bedroom about midnight, through the open window, crept between the sheets and went to sleep by his feet.

From observations of this particular animal my deductions were:

- I. Mainly nocturnal, sleeping during most of the day, except to sun itself for a short period during the early afternoon.
- II. Most active during the first part of the night, up to about midnight
- III. Not attracted by the 7 p.m. news, but responsive at the 9 p.m. news. Not responsive to music or any other sound on the wireless, except the voice of a male announcer, and I conclude that the general tone and vibration caused by a male voice on the wireless was the nearest approach to the call of another tree hyrax!
- IV. It would seem that the display as described above leading up to the call, was basically motivated by a sex impulse.
- V. With regard to food, this animal was entirely herbivorous, although it did accept odd tit-bits such as cake, milk, etc. Its favourites, as far as we could determine, were privet, *Ligustrum*, rose leaves, and wild laburnum, *Crotalaria*, but since it had the run of the garden at night it no doubt had other food plants.

Although it could at any time have gained complete freedom by returning to the forest, it chose to live out its life in, and in the vicinity of, the house, and in fact died a natural death at the foot of my cousin's bed, about a week after the death of my cousin.

With regard to the Tree Hyrax in its natural state, I can hardly add to the little that is known about this curious little animal. During three years' active service in the Emergency, mainly in the Aberdares, I can record the following observations:

Hyrax were abundant throughout the tree forest areas and mainly in mature stands of cedar in which the many hollow trunks afforded warm dry shelter.

Sometimes the hyrax could be seen on a hot sunny afternoon sunning themselves on a large exposed branch adjacent to their hole.

Little mounds of droppings on either one or the other side of the trees occupied by hyrax indicated that they invariably cast their droppings in one spot.

At the base of occupied trees there were usually one or more little runs, similar to those made by field rodents, leading into the adjoining undergrowth, used presumably, whilst foraging at night. Sometimes I found that a run led to a stump or exposed portion of a fallen tree, which was worn smooth. It is possible that such places are used by hyrax when "calling".

Although an occasional hyrax could be heard calling at various times of night, there appeared to be two distinct periods when it seemed as if every hyrax in the forest was calling, and on clear nights and particularly on moonlit nights, this was most noticeable. The first call period commenced at about 9 p.m. and maintained its loudest for about half an hour, after which it tailed off and ceased completely at about 10.30 p.m. So regular was this that on a number of occasions when my watch had stopped I would set it to 9 p.m. on the opening call of the hyrax, and on every occasion it was found accurate to within 15 minutes! The second period would be between 2 and 3 a.m. with a few calls up to within half an hour of dawn.

Although living singly or at most in couples, each to its individual tree, the obvious



interchange of calls at night, together with the ground "runs" found between tree and tree, leads me to believe that colonies exist in the same way as with Rock Hyrax. I can well imagine that during darkness there is a considerable "get-together" amongst members of each colony.

Hyrax were easily trapped in very great numbers by forest terrorists. I found a great many traps and without exception these were set at the base of trees that were inhabited by hyrax and at the spot that was used when descending or ascending.

The trap comprised a foot noose made of fine home-spun twine laid on the ground and attached to the tip of a bamboo shoot bent over like a taut bow, and released by a simple trigger device set beneath the noose. By this means so many were trapped that in some areas of the Aberdares the call of the hyrax became a rarity. Their reproductive capacity is obviously high, because today they appear to be as numerous as they were before.

(Received 12th February, 1960)

## AN ANTING DISPLAY BY THE BLACK-BELLIED SEED-CRACKER

By

JOHN HURRELL CROOK AND PRISCILLA M. ALLEN

On the morning of January 9, 1960, a male Black-bellied Seed-Cracker, *Pirenestes ostrinus* (Vieillot), was observed "anting" in a fork of the main trunk of a Para rubber tree (*Hevea brasiliensis*) some 20 feet from the ground in the Botanic Gardens, Entebbe, Uganda.

A small pile of leaves had gathered in the fork and a number of ants about half an inch in length had evidently made their nest there. The bird sat among the leaves, scabbled among them with its feet and at the same time fluffed the lower belly feathers and made the shuffling movements with the wings usual in most passerines during washing. The latter were both held drooped and tented over the flanks during the movements. In addition, the beak was plunged downwards among the leaves and drawn under the belly between the wings in repeated movements.

In this way the ants were evidently pushed or placed among the lower body feathers and on the inner surface of the wings. Ants were seen running out over the flanks and rump of the bird at the same time. The bird visited the ants three times for a duration of about five minutes on each occasion. Between the visits it sat on a nearby twig wiping its beak on it and making further shuffling movements with the wings. After some 20 minutes' observation with binoculars, x 8, and a telescope, x 20, the bird departed.

The behaviour most resembles the "indirect" anting of Simmons (1959) but the additional beak movements suggest "direct" participation and orientation of the activity by the bird. It is considered to be a combination of both the "direct" and the "indirect" anting methods.

### Reference

SIMMONS, K. E. L., 1959. Anting Movements. *Ibis* 101, 368-372.

(Received 25th April, 1960)

## SHORT NOTES ON THE BLACK COUCAL IN NORTHERN RHODESIA

By

T. C. L. SYMMES

A pair of Black Coucals, *Centropus toulou* Müller, was present on my property near Lusaka, Northern Rhodesia, during the rainy season in 1953. Though they have been seen in the area since, they have not bred again. They appear to be migratory and to enter the more suitable areas, "dambo" type country with scattered small trees and bushes, during the middle of the rains.

The area in which observations were made is by no means "dambo", consisting of a largish area of coarse, rank grass bounded by stands of tall *Brachystegia*, and having scattered about numerous small bushes of *Protea*, *Acacia*, *Bauhinia*, *Terminilia* and the like. Observations cover the period January 11 to February 15 and notes were made on ten separate days.

Calls recorded are as follows:—

- (a) "Cucut, ukut, ukut, ukut".
- (b) A low "Cuut, cuut, cuut".
- (c) A shrill, rapid, laughing call not syllabized.
- (d) A sound like a bubble coming to the surface—"Bloomph".

Calls were first heard around 6 a.m. The following displays were noted.

- (i) With both wings together, spread tail and drooping wings and billing. It is suggested that this might be solicitation—but this cannot be certain as the nest with young was found 18 days later.
- (ii) A flight from about 25-30 feet from a tree across and down into the area. This was a gliding flight with widespread wings and tail, and was accompanied by the laughing call, and ended in the grass—seven minutes later the "ukut" call was given four times and another ten minutes later at 18.30 the laughing call was repeated.
- (iii) With wings fanned and drooped, and tail spread. Feathers on mantle rather raised giving appearance of a ruff. Tail flicked from time to time. This was seen on the day the nest was found.

The nest was found on February 15 and contained two young. It was in coarse, rank grass, the base about nine inches above the ground. The nest was more or less hemispherical in shape about seven inches high, and made of interwoven wide ( $\frac{1}{2}$  inch) grass with other stems pulled over the top. It was lined with dry leaves. Within the next 48 hours the nest was robbed.

The remaining note I have is dated January 31, 1954, and relates to an area north of my property. A Black Coucal was seen to fly some 300 yards into a tree from which a Senegal Coucal, *Centropus senegalensis* Linn., was calling. Almost immediately both flew into the open, chasing each other, first one then the other leading. Both then flew into a small tree, the Black first, but at once both dropped into the grass apparently fighting, bodies vertical and feet towards each other. After a little while the Senegal Coucal called and both flew up from the grass in different directions, alighting about 50 yards apart. A short time later the Black Coucal flew further off.

(Received 17th May, 1960)

## HINDE'S PIED BABBLER IN THE EMBU DISTRICT

By

E. J. BLENOWE

From June 1955 till November 1957, I was stationed at Embu, where I found Hinde's Babbler *Turdoides Hindei* (Sharpe), a common bird. Since little is recorded of this species the following notes may be of interest. Although both the Northern Pied Babbler *Turdoides hypoleuca* (Cabanis), and Hinde's were common in the district, their distribution seemed to differ, Hinde's having a more restricted range. On no occasion did I record seeing these birds over an altitude of about 5,000 ft. or under 4,000 ft. They particularly seemed to like the fringes of cultivation where there were scattered trees, plenty of cover, and yet fairly open. On the other hand the Northern could be found anywhere from the forest edge at 6,000 ft. down to the semi-arid country near the Tana River at 3,000 ft. On no occasion did I see mixed parties of Hinde's and Northern. Although the two birds are quite easy to distinguish from each other I found the bright red eye of Hinde's a very important field characteristic (a point not made in Praed and Grant's "African Handbook of Birds"), the Northern has a whitish eye. Although the calls of the two birds are very similar and the variety great, I found I was able to distinguish each by its calls, that of Hinde's being less strident.

On September 7, 1957, I found a nest of Hinde's at Kiritiri. The choice of habitat and the formation of the nest was typical of the Northern. The nest was built near the top of a bush, 4½ ft. from the ground. The bush was at the edge of a small clump of trees into which the birds hastily retreated when alarmed. The cup of the nest was made from coarse grass and lined with finer grass. Two eggs were laid. I did not collect the eggs so was unable to compare them side by side with the eggs of the Northern, but I thought they were very much the same shade of blue. Eventually two chicks hatched out. The half-grown nestlings were slate grey in colour and had bright yellow gapes.

Although I did not find it possible to tell the male from the female in the field I thought by the difference in behaviour that there were two birds feeding the young. For the two hours I was watching, the parents were accompanied by two or three other birds. I could hear the party turning over leaves under the bushes, calling to each other softly as they hunted for food. While I was watching from the hide, nearly all the foraging for food was done on the ground under the bushes near the nesting site. The food brought to the young was a dark glutinous mass that might have been animal or vegetable matter and quite indescribable. Although I did take some photographs they were not very successful due to poor lighting conditions.

(Received 25th April, 1960)



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